Coronis

Getting Started Guide

Supported displays:

MDCC 2121, MDCG 2121, MDCG 3120

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Notice

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Trademarks

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Patent information

This product is covered under the following intellectual property rights:

US Patent RE43,707
US Patent 7,038,186
US Patent 7,166,829
US Patent 6,950,098
European Patent 1 274 066.

Indications for use

The Coronis displays are intended to be used in displaying and viewing digital images for review and analysis by trained medical practitioners.

The Coronis displays are not intended for primary diagnostic review of Mammography images.

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Preface

Regulatory compliance information

FCC Compliance Information

CLASS B:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to ensure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by Barco could void the user's authority to operate this equipment.

Canadian notice

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

CE mark notice

Declaration of Conformity in accordance with Article 10 (1) of the CE directive

This product has been designed and manufactured in accordance with the essential requirements of the Directives 2004/108/EC and MDD 93/42/EEC (amended by 2007/47/EC (class II b product), and for this product the procedures of Annex II have been applied to mark the product with the CE label.

Environmental information

Disposal Information

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display contain mercury.)

This equipment has required the extraction and use of natural resources for its production. It may contain hazardous substances for health and environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems.

Those systems will reuse or recycle most of the materials of your end-of-life equipment in a sound way.

The crossed-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administrator.

You can also contact us for more information on the environmental performances of our products.

Information for China ROHS compliance

Table of toxic and hazardous substances/elements and their content, as required by China's management methods for controlling pollution by electronic information products

	Toxic or hazardous Substances and Elements					
Part Name	**Pb**	**Hg**	**Cd**	**Cr6+**	**PBB**	**PBDE**
Metal parts	O	O	O	O	O	O
Plastic parts	O	O	O	O	O	O
PCB or PCBA	O	O	O	O	O	O
LCD panel	X	X	O	O	O	O
Power supply/adapter	X	O	O	O	O	O
Power cable	X	O	O	O	O	O
Connectors and cables	O	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006

中国大陆 RoHS

根据中国大陆 《电子信息产品污染控制管理办法》(也称为中国大陆 RoHS)，以下部份列出了本产品中可能包含的有毒有害物质或元素的名称和含量。

本表适用的产品

液晶显示器

有毒有害物质或元素

LCD Monitor						
零部件名稱	有毒有害物質或元素					
	铅 （Pb）	汞（Hg）	镉（Cd）	六价铬（Cr6+）	多溴联苯（PBB）	多溴二苯醚（PBDE）
金属机构件	O	O	O	O	O	O
塑料机构件	O	O	O	O	O	O
电路板组件 *	O	O	O	O	O	O
液晶面板	X	X	O	O	O	O
电源模块 / 适配器	X	O	O	O	O	O
电源线	X	O	O	O	O	O
外部信号连接线	O	O	O	O	O	O

*：电路板组件包括印刷电路板及其构成的零部件，如电阻、电容、集成电路、连接器等

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求以下

x：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 《电子信息产品中有毒有害物质的限量要求标准》规定的限量要求；
但是上表中打 “x” 的部件，其含量超出是因为目前业界还没有成熟的可替代的技术

Safety Instructions

General Recommendations

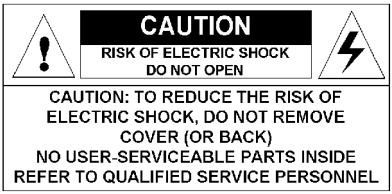
Read the safety and operating instructions before operating the display.

Retain safety and operating instructions for future reference.

Adhere to all warnings on the display and in the operating instructions manual.

Follow all instructions for operation and use.

Electrical shock



WARNING: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

WARNING: Do not modify this equipment without authorization of the manufacturer.

Type of protection (electrical):

Display with external power supply: Class I equipment

Degree of safety (flammable anesthetic mixture):

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Non-patient care equipment

Equipment primarily for use in a health care facility that is intended for use where contact with a patient is unlikely.

Power connection - display with external power supply

- Power requirements: The display must be powered using the delivered medical approved 12 VDC power supply.
- The medical approved DC power supply must be powered by the AC mains voltage.

Power cords:

- Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Power cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

Transient over-voltage

If the equipment is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.

To fully disengage the power to the unit, please disconnect the power cord from the AC inlet.

Water and moisture

Never expose the display to rain or moisture.

Never use the display near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

Ventilation

Do not cover or block the ventilation openings in the cover of the set. When installing the display in a cupboard or another closed location, heed the necessary space between the set and the sides of the cupboard.

Installation

Place the display on a flat, solid and stable surface that can support the weight of at least 3 displays. If you use an unstable cart or stand, the display may fall, causing serious injury to a child or adult, and serious damage to the equipment.

More warnings in the Installation chapter.

This apparatus conforms to:

IEC 60950-1:2005, IEC 60601-1:1988 + A1:1991 + A2:1995, IEC 60601-1:2005, IEC 60601-1-2:2007, UL 60950-1, 1st edition, 2007, UL 60601-1, 1st edition - 2006,ANSI/AAMI ES 60601-1:2006,CSA C22.2 No. 60950-1-03, 1st edition, 2006, CAN/CSA-C22.2 No. 601.1-M90, 2005, CAN/CSA-C22.2 No. 60601-1, 2008, CE - 2004/108/EC, CE - 93/42/EEC + 2007/47/EC, Class IIb, CE - 2011/65/EC, EN 60601-1-2:2007, RoHs, Demko - EN 60601-1:1990 + A1:1993 + A2:1995,Demko - EN 60601-1:2006, CCC - GB9254-2008, CCC - GB4943.1-2011, CCC - GB17625.1-2003, KCC (MDCG 2121), FCC class B, ICES-001 level B,VCCI, FDA 510(k)

National Scandinavian Deviations for Cl. 1.7.2 :

Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"
Norway: "Apparatet må tilkoples jordet stikkontakt"
Sweden: "Apparaten skall anslutas till jordat uttag"

EMC notice

No specific requirement on the use of external cables or other accessories except power supply.

With the installation of the device, use only the delivered power supply or a spare part provided by the legal manufacturer. Using another can result in a decrease of the immunity level of the device.

Electromagnetic emissions

The BARCO CORONIS Display is intended for use in the electromagnetic environment specified below.

The customer or the user of the BARCO CORONIS Display should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The BARCO CORONIS Display uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment
RF emissions CISPR 11	Class B	The BARCO CORONIS Display is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class D	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

This BARCO CORONIS Display complies with appropriate medical EMC standards on emissions to, and interference from surrounding equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device

must accept any interference received, including interference that may cause undesired operation.

Interference can be determined by turning the equipment off and on.

If this equipment does cause harmful interference to, or suffer from harmful interference of, surrounding equipment, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna or equipment.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician for help

Electromagnetic immunity

The BARCO CORONIS Display is intended for use in the electromagnetic environment specified below. The customer or the user of the BARCO CORONIS Display should assure that it is used in such an environment.

Immunity test	IEC 60601 Test levels	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6kV contact ± 8kV air	± 6kV contact ± 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%
Electrical fast transient/burst IEC 61000-4-4	± 2kV for power supply lines ± 1kV for input/ output lines	± 2kV for power supply lines ± 1kV for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment
Surge IEC61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment

Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5s	< 5% U_T (> 95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5s	Mains power quality should by that of a typical commercial or hospital environment. If the user of the BARCO CORONIS Display requires continued operation during power mains interruptions, it is recommended that the BARCO CORONIS Display be powered from an uninterruptible power supply or a battery.

U_T is the a.c. mains voltage prior to application of the test level

Immunity test	IEC 60601 test level	Level	Electromagnetic environment – guidance
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Not applicable	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 V 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the BARCO CORONIS Display, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with symbol:

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the mea-

sured field strength in the location in which the BARCO CORONIS Display is used exceeds the applicable RF compliance level above, the BARCO CORONIS Display should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the BARCO CORONIS Display.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

At 80 MHz and 800 MHz, the higher frequency range applies.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Recommended separation distance

The BARCO CORONIS Display is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer of the user of the BARCO CORONIS Display can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the BARCO CORONIS Display as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	80MHz to 800MHz $d = 1.2\sqrt{P}$	800MHz to 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter. Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection form structures, object and people.

Explanation of symbols

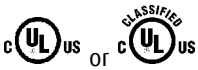
Symbols on the display and / or power supply

On the display or power supply, you may find the following symbols (nonrestrictive list):

Indicates compliance to the essential requirements of the Directive 93/42/EEC

Indicates compliance with Part 15 of the FCC rules (Class A or Class B)

Indicates the display is approved according to the UL regulations



Indicates the display is approved according to the c-UL regulations

Indicates the display is approved according to the DEMKO regulations

Indicates the display is approved according to the CCC regulations

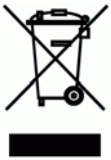
Indicates the USB connectors on the display

Indicates the manufacturing date

Indicates the temperature limitations for the display to operate within specs

Indicates the display serial no.

Consult the operating instructions



Indicates this apparatus must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive

Symbols used throughout the manual:

Warning: Risk of injury to human beings

Caution: Risk of damage to the product

Important notice or remark

Note

Hint, tip

Additional information

Recommendations for using your display system

1. Optimize the lifetime of your display

Enabling the Display Power Management System (DPMS) of your display (in the display's Settings menu) will optimize its diagnostic lifetime by automatically switching off the backlight when the display is not used for a specified period of time. By default, DPMS is enabled on your display, but it also needs to be activated on your workstation. To do this, go to "Power Options Properties" in the "Control Panel".

Barco recommends setting DPMS activation after 20 minutes of non-usage.

2. Use a screen saver to avoid image retention

Prolonged operation of an LCD with the same content on the same screen area may result in a form of image retention.

You can avoid or significantly reduce the occurrence of this phenomenon by using a screen saver. You can activate a screen saver in the "Display properties" window of your workstation.

Barco recommends setting screen saver activation after 5 minutes of non-usage. A good screen saver displays moving content.

In case you are working with the same image or an application with static image elements for several hours continuously (so that the screen saver is not activated), change the image content regularly to avoid image retention of the static elements.

3. Understand pixel technology

LCD displays use technology based on pixels. As a normal tolerance in the manufacturing of the LCD, a limited number of these pixels may remain either dark or permanently lit, without affecting the

diagnostic performance of the product. To ensure optimal product quality, Barco applies strict selection criteria for its LCD panels.

To learn more about LCD technology and missing pixels, consult the dedicated white paper available at www.barcomedical.com.

4. Enhance user comfort

Every Barco multi-head display system is color matched with the highest specification in the market.

Barco recommends keeping color-matched displays together. Furthermore, it is important to use all displays of a multi-head configuration at the same rate to preserve color matching throughout the economic lifetime of the system.

5. Maximize Quality Assurance

The 'MediCal QAWeb' system offers online service for high-grade Quality Assurance, providing maximum diagnostic confidence and uptime.

Learn more and sign up for the free MediCal QAWeb Essential level at www.barcomedical.com/qa

Display controller installation

Display Controller Installation

Which display controller?

Your Barco medical display is compatible with a large range of Barco and non-Barco display controller boards. Depending on the customer's order details, the display can be delivered with or without display controller.

The brochure "Barco medical display overview" on the website www.barco.com/medical (Downloads section) contains a comprehensive overview of the compatibility matrix of Barco displays and Barco display controllers.

If you are using Barco display controllers, please follow the installation instructions in this section. If you are using a non-Barco display controller, please consult the corresponding documentation.

Installing a Barco display controller

This chapter will guide you through the physical installation of a Barco display controller for your display system.

CAUTION – Wear a grounded, protective ESD strap when handling or during installation of the display controller. Electrostatic charges can damage the display controller.

Overview

Prior to installing the display controller(s) for your BARCO CORONIS Display System in your PC please take a few minutes to familiarize yourself with both the display controller(s) and the PCIe or PCI slots in your computer.

Types of display controllers for Barco Display Systems

The following models of Barco display controllers are available for your display system. Please check which of the following models is delivered with your system, and follow the corresponding installation instructions:

Board Model	VGA Jumper	Compatible PCIe/PCI Slot
Barco MXRT 1150	No	x1*, x8, x16
Barco MXRT 2100	No	x16
Barco MXRT 2150	No	x16
Barco MXRT 5100	No	x16
Barco MXRT 5200	No	x16
Barco MXRT 7100	No	x16
Barco MXRT 7200	No	x16
Barco MXRT 7300	No	x16
BarcoMed Coronis PCIe	Yes	x8*, x16
BarcoMed Coronis PCI	Yes	PCI 32 or PCI 64*
BarcoMed Nio PCIe	Yes	x8*, x16
BarcoMed Nio PCI	Yes	PCI 32 or PCI 64*
BarcoMed 5MP2FH PCIe	Yes	x8*, x16
BarcoMed 5MP2FH PCI	Yes	PCI 32 or PCI 64*

* *Recommended PCI/PCIe slot*

Note: You can use x16 & x8 slots for x1, & x4 boards.

If you are using a display controller with a VGA jumper, you will need to decide if you are going to use its on-board VGA capabilities. If you are, check the setting of the Jumper at J-1 on the display controller (see figure 1). By default, VGA should be enabled, on the top two pins. To disable the on-board VGA capabilities move the jumper so that it is on the middle and bottom pins.

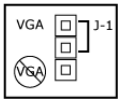


Figure 1: Display controller VGA Jumper, VGA enabled

Note: To use multiple BarcoMed display controllers in a single computer, you need to enable VGA on only ONE of the BarcoMed display controllers and disable VGA on ALL the other BarcoMed display controllers. To use a BarcoMed display controller with a third party VGA controller or with one or more Barco MXRT display controllers, do **NOT** enable VGA on the BarcoMed display controller.

Which PCI/PCIe slot to use

The table on the preceding page lists the different display controller model(s) available for your BARCO CORONIS Display System and the recommended PCI/PCIe slot to use for optimum performance. Figure 2 shows the different types of PCIe slots that can be used.

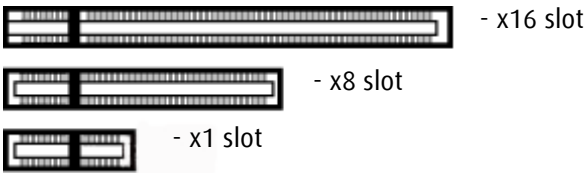


Figure 2: Examples of PCIe slots

Figure 3 shows the two different types of PCI slots that can be used.

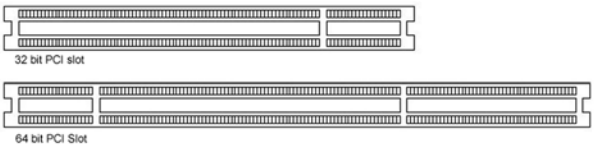


Figure 3: Examples of PCI slots

Installation Procedure

The following instructions will take you step by step through the installation of the display controller(s) for your BARCO CORONIS Display System.

CAUTION – Wear a grounded, protective ESD strap when handling or during installation of the display controller. Electrostatic charges can damage the display controller.

1. If you are not going to use your old graphics card, uninstall the drivers and software for it if you have not already done so.
2. Turn off the computer, display(s), and other peripheral devices.
3. Unplug the computer's power cord and disconnect all cables from the back of your computer.

Caution – Wait approximately 20 seconds after unplugging the power cord before disconnecting a peripheral or removing a component from the motherboard to avoid possible damage to the motherboard.

4. Remove the computer cover.

   If necessary, consult your computer's manual for help in removing the cover.
5. If necessary, unscrew or unfasten and remove any existing graphics card(s) from your computer.

Note: If you are using a motherboard containing an on-board graphics solution and do not intend to use it as part of a multiple-display setup, disable it either in the computer's System Set-up utility (BIOS) or the Windows device manager.

6. Locate the appropriate slot and, if necessary, remove the metal back-plate cover(s).

7. Align the display controller(s) for your BARCO CORONIS Display System with the slot(s) and press it(them) in firmly until the card(s) is(are) fully seated.

Note: The next step applies only to the MXRT 5100, MXRT 7100, and MXRT 7200.

8. Connect the power cable(s) to the 6-pin power connection(s) on the graphics card. Make sure the cables are not interfering with anything inside the computer (for example, a cooling fan).

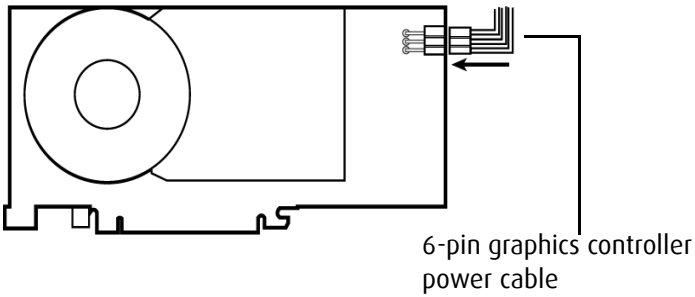


Figure 4: Power connection for the MXRT 5100, 7100, & 7300 controllers

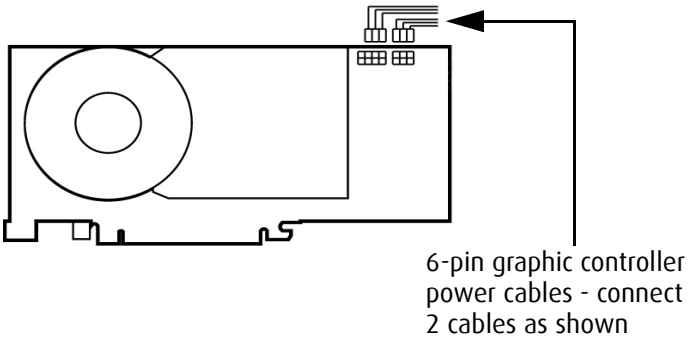


Figure 5: Power connection for the MXRT 7200 controller

9. Screw in or fasten the display controller securely. Replace and secure the computer cover.

10. Connect your BARCO CORONIS Displays to the display controller(s) for your BARCO CORONIS Display System using the cables supplied. Make sure all cables are securely connected before turning on your system. Figures 6 - 10 show the types of connections are available:

Connecting your Barco displays

For a detailed description of the display installation and signal connection, please refer to the **"Display installation"** section of this manual.

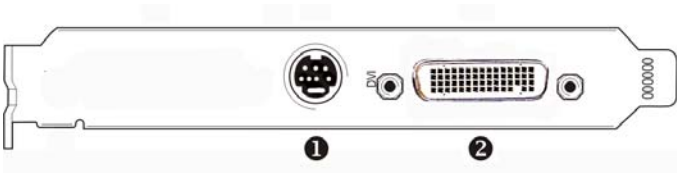


Figure 6:

IO-Panel for the Barco MXRT 1150 and Barco MXRT 2150

❶	S-Video Connection This option is not supported by Barco.
❷	DMS-59 connector provides DVI-I / Head 1 & Head 2 output connections through included Y adaptor cable.

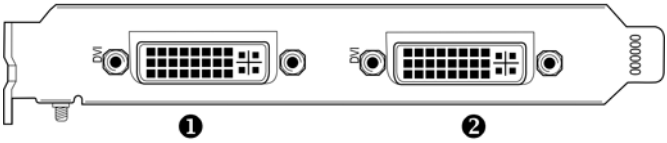


Figure 7:

IO-Panel for the Barco MXRT 2100 and Barco MXRT 5200

	MXRT 2100		MXRT 5200
❶	Head 2– DVI-I Connection	❶	Head 1– DVI-I Connection
❷	Head 1– DVI-I Connection	❷	Head 2– DVI-I Connection

Note: For 6mp, connect Head 1 to left input, and Head 2 to right input.

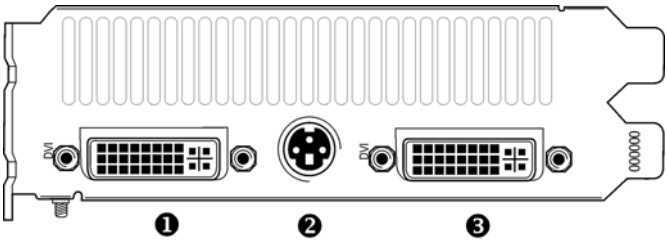


Figure 8:

IO-Panel for the Barco MXRT 5100, Barco MXRT 7100 and Barco MXRT 7200

❶	Head 1 – DVI-I Connection
❷	Stereo Connection This option is not supported by Barco.
❸	Head 2 – DVI-I Connection

Note: For 6mp, connect Head 1 to left input, and Head 2 to right input.

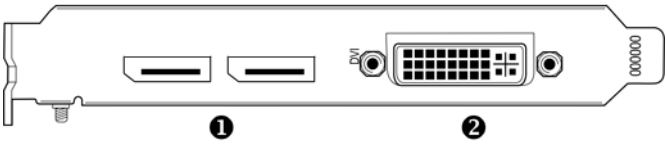


Figure 9:

IO-Panel for the Barco MXRT 7300

1	DisplayPort Connections
2	DVI-I Connection

Note: Disconnecting the DisplayPort cable may lock the display.

Note: Only two of the three connectors can be used at a time. Driving three displays is not supported with the MXRT 7300.

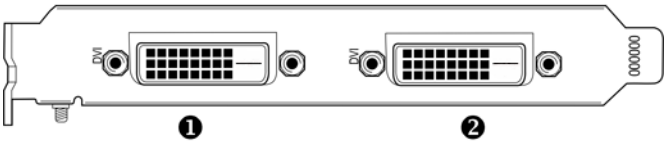


Figure 10:

IO-Panel for the BarcoMed Coronis, BarcoMed Nio, and BarcoMed 5MP2FH family of display controllers

1	Head 1 – DVI-D Connection
2	Head 2 – DVI-D Connection

11. Reconnect any cables you have disconnected and plug in the computer's power cord.

12. Turn on the display(s) and then your computer.

Turning on your system

WARNING - Turn on your display(s) before you turn on your computer. Failure to do so could damage your display(s).

If you have properly installed your graphics card, the Windows start-up messages will appear once the boot procedure is finished.

Note: Your Barco display(s) will be running in a basic video mode at a default refresh rate. Higher resolutions and refresh rates, such as 1536x2048@60Hz, are not available at this stage of the installation. Once you have installed the BARCO CORONIS Display System drivers and software, the Barco monitor Plug and Play software should automatically set the resolution for the displays.

13. Install the drivers, QAWeb software and documentation for your BARCO CORONIS Display System by following the instructions in the **Driver and Software Installation** section of this manual.

Display installation

Installation precautions

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Avoid reflections in the flat panel to reduce eye strain.
- Place the display on a strong and stable table or desk.
- Keep the display away from heat sources and provide enough ventilation around the display.
- Do not use the display in direct sunlight.
- Do not scratch or apply pressure to the screen. This may cause permanent damage.

Display parts, controls and connectors

Front

The front controls are soft touch keys.

When you touch any of them while no on-screen display (OSD) is on the screen, the front illumination is switched on for a few seconds.

When you touch a key again *while the illumination is on*, the function of the key is executed.

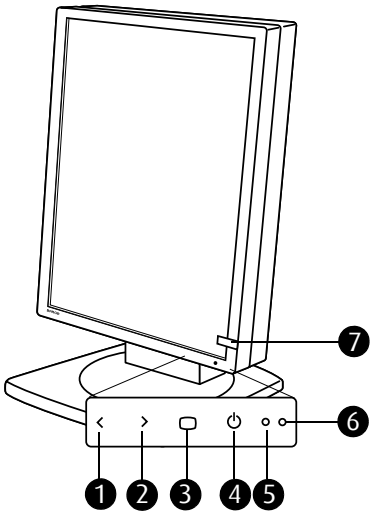


Figure 11: Front view

1. **Left/Down**

   To move down or decrease values in the OSD.

2. **Right/Up**

   To move up or increase values in the OSD.

3. **Enter**

To display the OSD (on-screen display). In the OSD, this button acts as Enter button to make selections.

4. **Standby**

   To put the display in standby mode.

5. **Ambient light sensor**

   Senses the ambient light around the display. The ambient light measurement is taken into account in the DICOM display function calibration.

6. **Power LED**

   Indicates the display's power status.

   Green: Display is on (when enabled in the OSD).

   Orange: Display is in Standby power-saving mode.

   Off: Display is disconnected from the power or the LED's on state is disabled in the OSD.

Note: When the LED is disabled in the OSD, it will still be activated (green) when the display is on but does not receive any video signal.

7. **I-Guard sensor**

   Constantly measures and stabilizes the display light output and (on a color display only) color temperature.

Rear

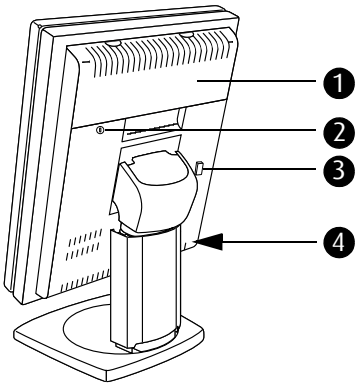


Figure 12: Rear view

1. Connector compartment cover.

   Detach to get access to the signal connectors.

2. Slot for security cable (e.g., Kensington lock).

3. Push-button to release the panel unit from the tilt & swivel foot in **landscape** orientation.

4. (Not visible on drawing, hidden by the display stand) Push-button to release the panel unit from the tilt & swivel foot in **portrait** orientation.

Connectors

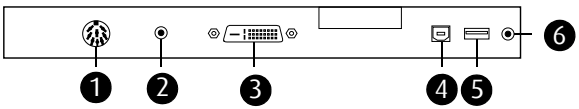


Figure 13: Connectors

1. DC power input.

Connect the output of the DC power supply delivered with the display to this connector.

2. +5 Vdc, 0.25 A power output for accessories.
3. DVI (digital) video input.
4. USB upstream port (to PC).
5. USB downstream port (to peripheral USB devices).
6. Power output for asset management.

Side

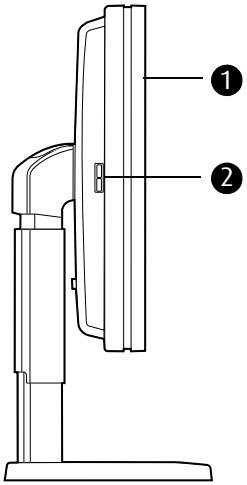


Figure 14: Side view

1. Display panel unit
2. USB downstream ports.

Foot

The display stand is packaged separately from the display panels. After unpacking you have to click the panels to the stand. There are several types of stands, depending on the number of panels in the system.

Single-head stand

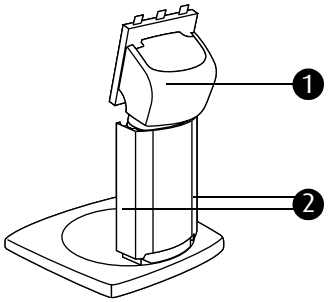


Figure 15: Single-head stand (rear view)

1. Tilt & swivel neck cover.

   Detach before connecting the signal cables.

2. Cable duct covers.

   Push down and turn to open before connecting the signal cables.

Dual-head stand

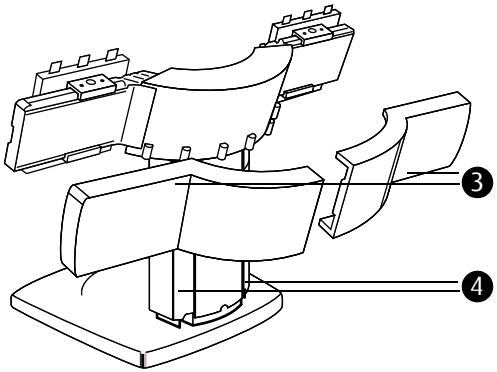


Figure 16: Dual-head stand (rear view)

3. Arm covers.

The covers are packaged separately from the stand. You have to click them to the arms after connecting the signal cables.

4. Cable duct covers.

Push down and turn to open before connecting the signal cables.

Single-head installation

To attach the panel unit to the display stand:

1. Take the display stand from the packaging and put it on a solid flat surface.
2. Take the panel unit from the packaging and hold it in portrait position. The I-Guard should be positioned bottom right.
3. Hook the top gaps in the rear of the panel over the top anchors of the stand attachment plate (1). see figure 17.
4. Push the bottom of the panel firmly towards the stand so that the bottom anchors clip in the bottom gaps (2).
5. Check that the panel is **firmly attached** to the stand.

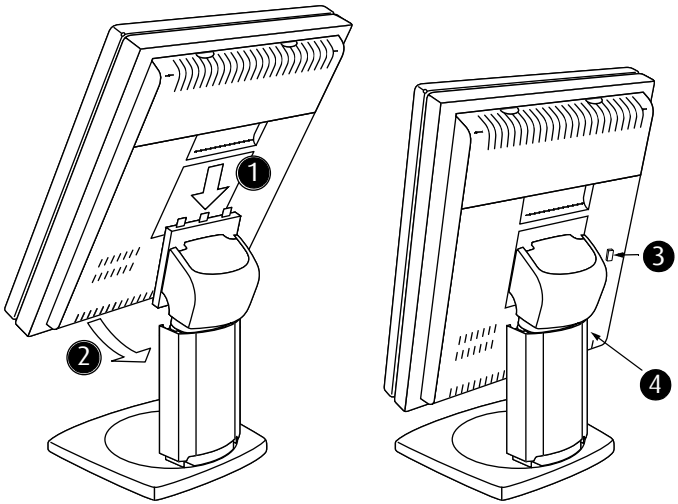


Figure 17: Attaching the panel to the display stand

To detach the panel unit from the display stand:

1. Firmly push the push-button at the rear of the panel (3) or (4). Push button (3) to release the panel in landscape position. Push button (4) to release the panel in portrait position (button not visible on drawing because hidden by the display stand).
2. Pull the bottom of the panel towards you and at the same time lift the panel from the stand attachment plate.

Dual-head installation

To attach the panel units to the dual-head stand:

1. Take the stand from the packaging and put it on a solid flat surface.

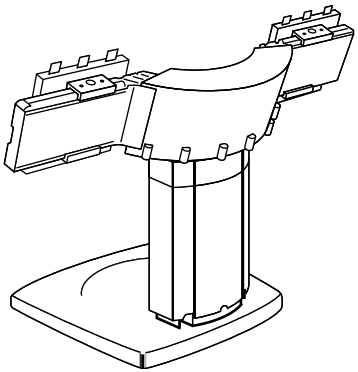


Figure 18: Dual-head stand

2. Unpack the panels.
3. Slide the display brackets on the stand arms in the correct position. The correct position is indicated on a label on the rear of the panels. There is a measure for portrait orientation and one for landscape orientation.

   Position both display brackets so that the indicator on the brackets corresponds to the measure on the label.

   Secure them with the supplied Allen key.

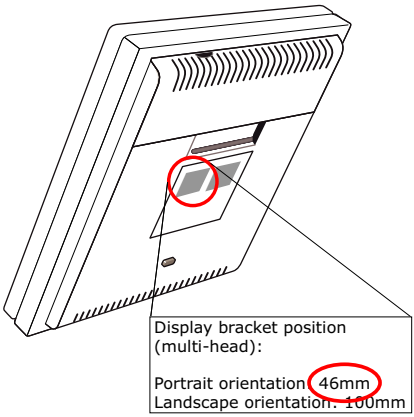


Figure 19: Example of label with position for brackets

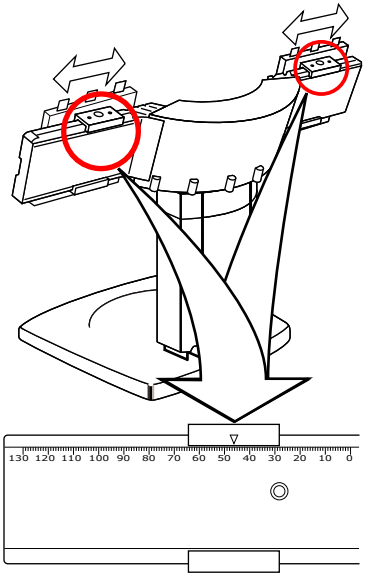


Figure 20: Shift brackets according to label indication

4. Take one of the panels and hold it in the desired position (portrait or landscape).

5. Hook the top gaps in the rear of the panel over the top anchors of the bracket (figure 21 below).
6. Push the bottom of the panel firmly towards the stand so that the bottom anchors clip in the bottom gaps (figure 21 below).

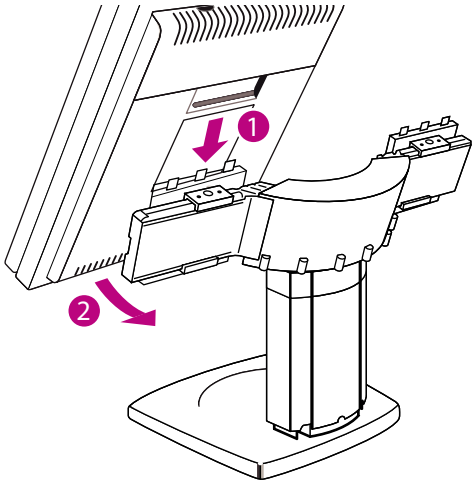


Figure 21:

7. Repeat steps 4. to 6. for the second panel in the packaging.
8. Check that both panels are **firmly** attached.

Vesa-mount installation

Important:

- Use an arm that is approved by VESA (according to the VESA 100 mm standard).
- Use an arm that can support a weight of at least 10 kg (22.05 lbs).

To attach the panel unit to an arm stand:

1. Unscrew the 4 screws (M4 x 8 mm) from the rear of the display panel.
2. Attach the panel **firmly** to the arm stand using 4 screws M4 x 10 mm.

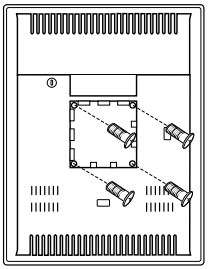


Figure 22: : Vesa mount fixation holes

Adjust panel orientation

To adjust the panel orientation:

1. Before turning the display panel, lift it in its heighest position. If not, the corner of the panel might hit the foot during the rotation.
2. To change from portrait to landscape, turn the panel counterclockwise.
3. To change from landscape to portrait, turn clockwise.

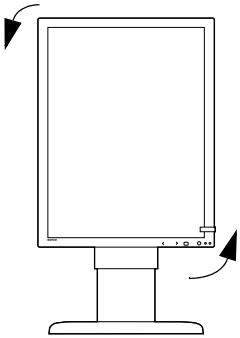


Figure 23: Portrait orientation

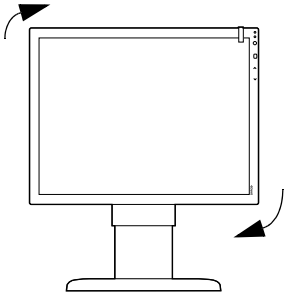


Figure 24: Landscape orientation

Note: To rotate the image after rotating the panel, change the resolution in the Display Properties control panel.

Connecting the signal cables

To connect the signal cables to the display:

1. Make sure the computer is turned off.
2. To get access to the connectors, remove the connector compartment cover (1).

   To remove the cover, gently pull the bottom side of the cover upward or firmly press down the 2 clips at the top side (positions marked in the plastic).
3. To facilitate cable routing afterwards, remove the tilt & swivel neck cover (2). Therefore, first tilt the display panel in upright position. Then lift and pull backward the neck cover.
4. Also to facilitate cable routing afterwards, open both cable duct covers (3).

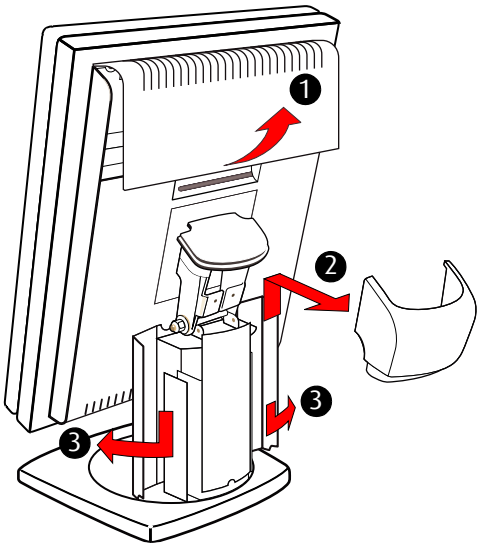


Figure 25: Remove covers before connecting signal cables

5. Connect signal cables:

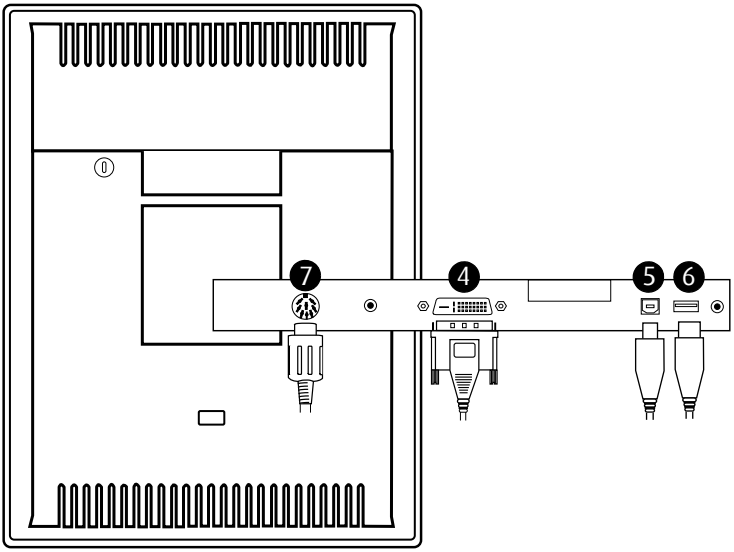


Figure 26: Signal cable connections

- Connect one end of the DVI cable to the DVI input of the display (4). Connect the other end of the DVI cable to the DVI connector of the display controller board.
- Connect a PC USB downstream connector to the display's USB upstream connector by means of a USB cable (5).
- Connect any USB device to one of the display's USB downstream connectors (6)
- Connect the DC power input (7) of the display to the external DC power supply. Connect the other end of the external DC power supply to a **grounded** power outlet by means of the proper power cord delivered in the packaging (8).

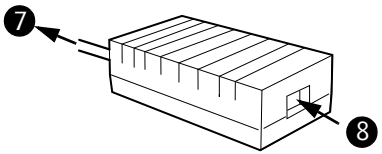


Figure 27: External DC power supply

Cable routing

To route the cables:

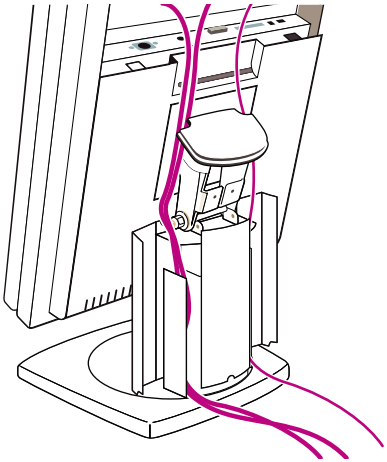


Figure 28: Display rear view

1. Bind the cables in the connector compartment together with the cable tie inside the connector compartment.
2. Route the cables alongside the neck and in the cable ducts in the tilt & swivel foot. See figure 28 above.
3. Re-attach the connector compartment cover and neck cover. Close the cable duct covers. Push the cable duct covers upward to lock them.

To route the cables:

1. Bind the cables in the connector compartments together with the cable ties inside the connector compartments.
2. Re-attach the connector compartment covers.

3. Unpack the plastic stand arm covers and attach them to the display stand.

To attach the arm covers, first slide the covers horizontally over the arms and then push them firmly against the arms so that the covers' plastic clips hook in the grooves in the metal arms.

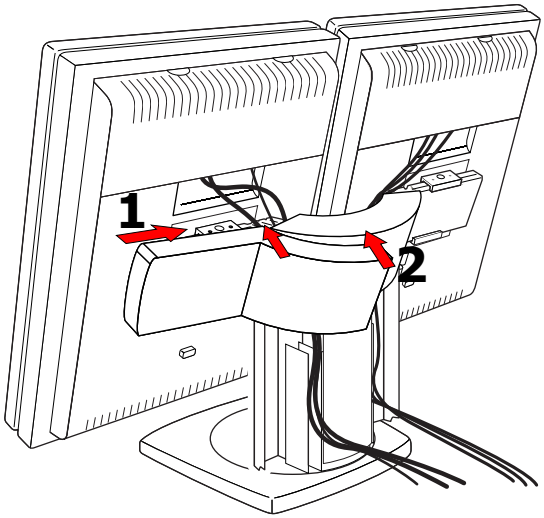


Figure 29: Attach arm covers

4. Close the cable duct covers. Push the cable duct covers upward to lock them.

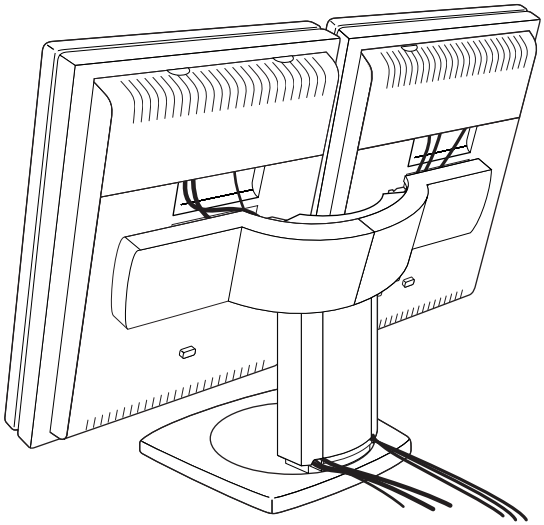


Figure 30: Installation complete

Cleaning instructions

Precautions

- Take care not to damage or scratch the glass or LCD panel. Be careful with rings or other jewellery that can touch the glass.
- Do not apply pressure on the glass or LCD panel.
- Do not apply or spray liquid directly to the glass, panel or cabinet as excess liquid may cause damage to internal electronics. Instead, apply the liquid to the cleaning cloth.

Front glass

Proceed as follows:

Clean the glass using a sponge, cleaning cloth or soft tissue, **lightly** moistened with one of the following tested products:

- Flux
- Windex Glass Plus
- Bohle glass cleaner
- Mr. Proper
- Pril
- Ajax glass cleaner
- Sidolin glass cleaner

In case none of the above cleaning products is available, use plain water.

Do NOT use:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride

- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

Cabinet

Proceed as follows:

- Clean the cabinet using a soft cotton cloth, lightly moistened with a recognized cleaning product for medical equipment.
- Repeat with water only.
- Wipe dry with a dry cloth.
- The cabinet has been tested for resistance to the following products:
    - Cidex, Betadine
    - Alcohol (Isopropyl and Ethyl)
    - Ammonia-based cleaners (Windex)
    - Aquasonic Gel

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Software installation

Driver and Software Installation

This chapter will guide you through the installation of the drivers, software and documentation associated with your BARCO CORONIS Display System or BARCO CORONIS Display(s).

The process for the BARCO MXRT family of controllers and BARCOMED family of controllers is handled separately.

If you install Barco displays without Barco display controllers, no drivers will be installed. Only the online user manual will be installed on your system.

Driver and software installation prerequisites

Note: To install or remove the drivers, software, or documentation you must be logged on as a user with administrator privileges.

Your operating system must be installed and running before you can install the driver, software and documentation for the display controller(s) for your BARCO CORONIS Display System.

Before you begin make sure that all of your BARCO CORONIS Display(s) are connected to the appropriate display controller(s) in your system.

Note: This installation procedure is based on operating Windows in “Classic” view style. If “Home” or “Default” view style is selected in Windows, sections of this procedure may be different than what is listed.

Installing the BARCO MXRT drivers and software

Note: The installation dialog will display in English if your operating system’s language is not supported.

This process applies to the following versions of Windows:

- Windows XP Professional,

- Windows XP Professional x64 Edition,
- Windows Server 2003,
- Windows Server 2003 x64 Edition,
- Windows Server 2008,
- Windows 2008 x64, and
- Windows Vista 32 & 64 Bit Edition.

You will need to install the BARCO CORONIS Display system drivers and software in the following cases:

- After you have installed the display controller(s) for your BARCO CORONIS Display System in your system for the first time.
- After you have reinstalled or upgraded your operating system.
- After you have moved the display controller(s) to a different PCI/PCIe slot.
- When you upgrade to a newer version of the MXRT driver.
- When you put additional MXRT display controllers in your system.

1. You do not need to manually uninstall an existing driver before updating to the current version. The Barco Product Installation Wizard will detect any prior installations and start the uninstallation process automatically.

   Start your system. When the *Found New Hardware Wizard* comes up, click **Cancel**. When the *System Settings Change* window asks you to restart your computer, click **No or Restart Later**.

2. Run the Barco Product Installation Wizard.

   The Barco Product Installation Wizard should start automatically when you insert the BARCO CORONIS Display System Installation CD-ROM into your computer's CD/DVD drive *after* the operating system has started. If your CD/DVD drive's auto-run is not enabled or the Barco Product Installation Wizard does not start automatically, you can run the Barco Product Installation Wizard manually by following these steps:

   a) Click the **Start** button in the task bar.

b) Click **Run**.

c) Click **Browse** and browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM and click on the file, **Setup.exe,** and click **Open**.

d) Click **OK**.

or

a) Browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM and double click on the file, **Setup.exe**.

3. Click **Next twice.**

4. Click **Yes** to accept the terms of the MediCal QAWeb Agent license agreement. The Barco setup wizard will continue with the installation **only** if you accept the terms of the license agreement. If you click **No**, the wizard will exit. Click **Next.**

5. Follow the wizard's on-screen instructions to complete the MediCal QAWeb installation.

6. The Barco Product Installation Wizard will now guide you through the installation of the driver.

7. Click **Yes** to accept the terms of the Barco and ATI license agreements. The Barco setup wizard will continue with the installation **only** if you accept the terms of both license agreements. If you click **No**, the wizard will exit. Click **Next.**

8. Follow the wizard's on-screen instructions to complete the driver installation.

Note: The driver installation may take up to 5 minutes, and the monitor may blink a few times during the installation process.

Note: For "non-English" operating systems, you may encounter multiple pop-up screens. If this occurs, click the appropriate buttons to complete the installation.

9. When the driver setup is complete, click the **Finish** button.

10. When the Setup complete message appears, select **Reboot System Now** and click **Finish**.

11. After the system reboots, Windows may display either the *Digital Signature Not Found* message or *The software you are installing for this hardware has not passed Windows logo testing*.

Automated display configuration

Once the drivers, software and documentation have been installed and your system has been rebooted, the *Barco Monitor Plug and Play Software* should automatically detect your Barco displays and attach them to the desktop with the correct resolution. If the *Barco Monitor Plug and Play Software* fails to detect your Barco displays or fails to attach them to the desktop correctly please refer to the section, **Setting the resolution of your Barco Display** in the **Configuring Windows** section of this manual.

Reinstalling drivers

You can install new drivers or reinstall existing drivers at any time by using the Barco Set-up wizard on your BARCO CORONIS Display System Installation CD-ROM, see **Installing the BARCO MXRT drivers and software**, on page 62 of this manual.

Uninstalling the drivers and software

To uninstall the Barco drivers, software or documentation for your Barco Coronis Display Systems, please use the *Windows Add/Remove Programs* or *Uninstall* utility. This can be found in the Windows Control Panel. For Vista use *Programs & Features.*

Note: When uninstalling the Barco MXRT drivers, the dialog box shown in figure 31 will appear, and select the driver listed.

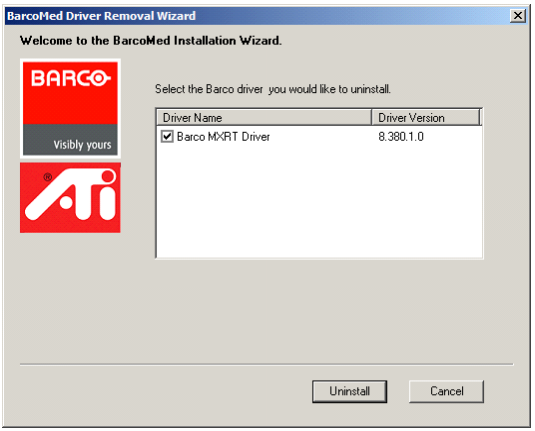

Figure 31: Barco MXRT Driver Removal Wizard (driver version may be different than what is pictured)

Note: *Vista Only:* After uninstalling the driver, shutdown the machine and remove the card. If you leave the card in the system, Vista will automatically reinstall the driver.

If you are uninstalling the Barco MXRT drivers prior to doing a driver upgrade, complete the Barco MXRT Driver Removal Wizard as described, and reboot the system into Safe Mode. From Safe Mode, run the Program Files\Barco\ MXRT_DriverCleaner batch file to remove any remaining files. Then you can reboot into regular Windows mode to install the new driver.

Command line (Silent) Install of Drivers and Software

(Not supported with Windows Vista)

Specifying the silent install option causes most of the GUI associated with the installer to disappear. A background progress window will still be visible, but no user input will be required.

The silent install behavior is dictated by the *SETUP.INI* file. Each application is allowed to have separate command-line parameters for normal and silent installs.

To install the drivers and software silently, please follow the steps below:

1. Insert the BARCO CORONIS Display System Installation CD-ROM into your CD/DVD drive. When the Barco Product Installation Wizard starts click **"Cancel"**.
2. Click the **Start** button in the task bar.
3. Click **Run**.
4. Click **Browse** and
   a) Browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM.
   b) Click on the file, **Setup.exe,** and click **Open**.

   or

   a) Browse to the root directory of the location where you saved the contents of your BARCO CORONIS Display System Installation CD-ROM.
   b) Click on the file, **Setup.exe,** and click **Open**.
5. In the *Open* address window, place your cursor at the end of the line of text that appears and add the following text after *Setup.exe*, a space and *-silent*. Click **OK**.

   Example (where D is the name of your CD/DVD drive):

   D:\Setup.exe -silent

   See figure 32 for an example of how the command line window should look when using the silent install from the BARCO CORONIS Display System Installation CD-ROM.

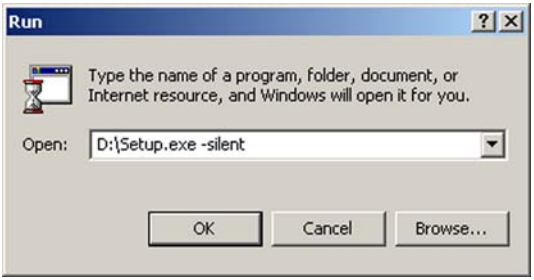

Figure 32: Command line installation

Note: When performing an MXRT driver upgrade, it is essential to uninstall the previous installation before installing the new driver. We also recommend that you perfrom the following steps to completely remove the previously installed files:

a) Boot the system in safe mode.

b) Run MXRT driver cleaner.bat by double clicking on it (this will either be installed as an icon on your desktop, or can be found on the Barco Display System installation CD at: *drivers\2KXP\ATI*). This will remove all the previous installed MXRT driver files.

c) Reboot the system in regular mode and install the new driver.

Installing the BarcoMed Coronis or Nio drivers and software

Note: The installation dialog will display in English if your operating system's language is not supported.

This process applies to the following versions of Windows:

- Windows 2000 Professional,
- Windows XP Professional,
- Windows XP Professional x64 Edition,
- Windows Server 2003,

- Windows Server 2003 x64 Edition, and
- Windows Vista 32 & 64 Bit Edition.

You will need to install the BARCO CORONIS Display system drivers and software in the following cases:

- After you have installed the display controller(s) for your BARCO CORONIS Display System in your system for the first time.
- After you have reinstalled or upgraded your operating system.
- After you have moved the display controller(s) to a different PCI/PCIe slot.

1. Start your system. When the *Found New Hardware Wizard* comes up, click **Cancel**. When the *System Settings Change* window asks you to restart your computer, click **No or Restart Later**.
2. Run the Barco Product Installation Wizard.

   The Barco Product Installation Wizard should start automatically if you insert the BARCO CORONIS Display System Installation CD-ROM into your CD/DVD drive *after* the operating system has started. If your CD/DVD drive's auto-run is not enabled or the Barco Product Installation Wizard does not start automatically, you can run the Barco Product Installation Wizard manually by following these steps:

   a) Click the **Start** button in the task bar.

   b) Click **Run**.

   c) Click **Browse** and browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM and click on the file, **Setup.exe,** and click **Open**.

   d) Click **OK**.

   or

   a) Browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM and double click on the file, **Setup.exe**.
3. Click **Next** twice.

4. Follow the wizard's on-screen instructions to complete the installation.

Note: When the page shown in figure 33 appears you may either click **Next** to accept the default settings or if you know the settings required for your viewing application, you may select them now and then click **Next**. You may change these settings later by accessing the Barco Driver tab within the *Windows Display Control Panel*.

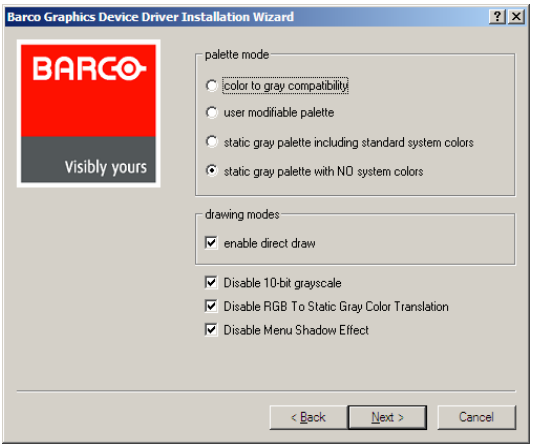

Figure 33:

Please refer to your application manuals for information on the correct Palette and Drawing modes to select.

5. When the driver setup is complete, click the **Finish** button.
6. The Barco Product Installation Wizard will now guide you through the installation of MediCal QAWeb, BarcoMed SelfExam, and the Barco on-line documentation.
7. When the Setup complete message appears, select **Reboot System Now** and click **Finish**.
8. After the system reboots, Windows may display either the *Digital Signature Not Found* message or *The software you are*

installing for this hardware has not passed Windows logo testing.

Automated display configuration

Once the drivers, software and documentation have been installed and your system has been rebooted, the *Barco Monitor Plug and Play Software* should automatically detect your Barco displays and attach them to the desktop with the correct resolution. If the *Barco Monitor Plug and Play Software* fails to detect your Barco displays or fails to attach them to the desktop correctly please refer to the section, **Setting the resolution of your Barco Coronis Display** in the **Configuring Windows** section of this manual.

Reinstalling drivers

You can install new drivers or reinstall existing drivers at any time by using the Barco Set-up wizard on your BARCO CORONIS Display System Installation CD-ROM, see **Installing the BARCOMED CORONIS or Nio drivers and software**, on page 68 of this manual.

Uninstalling the drivers and software

To uninstall the Barco drivers, software or documentation for your Barco Coronis Display Systems, please use the *Windows Add/Remove Programs* or *Uninstall* utility. This can be found in the Windows Control Panel. For Vista use *Programs & Features*

Note: If you installed your BARCOMED CORONIS or Nio drivers with DualView enabled, the wizard will warn you that DualView must be disabled before the drivers can be uninstalled. This is normal, please follow the prompts from the wizard.

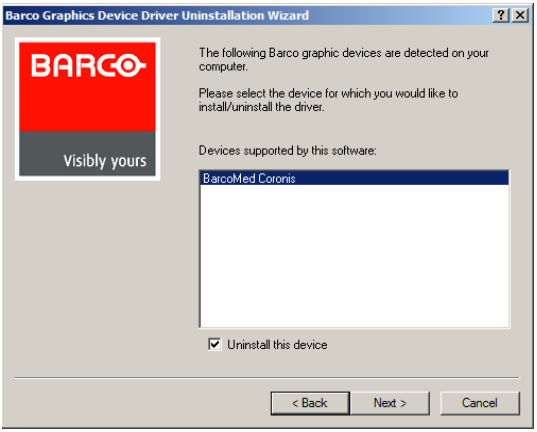
Barco Graphics Device Driver Uninstallation Wizard
BARCO
Visibly yours
The following Barco graphic devices are detected on your computer.
Please select the device for which you would like to install/uninstall the driver.
Devices supported by this software:
BarcoMed Coronis
Uninstall this device
< Back
Next >
Cancel

Figure 34: Barco Driver Removal Wizard

Command line (Silent) Install of Drivers and Software

(Not supported with Windows Vista)

Specifying the silent install option causes most of the GUI associated with the installer to disappear. A background progress window will still be visible, but no user input will be required.

The silent install behavior is dictated by the *SETUP.INI* file. Each application is allowed to have separate command-line parameters for normal and silent installs.

To install the drivers and software silently, please follow the steps below:

1. Insert the BARCO CORONIS Display System Installation CD-ROM into your CD/DVD drive. When the Barco Product Installation Wizard starts click **"Cancel"**.
2. Click the **Start** button in the task bar.
3. Click **Run**.
4. Click **Browse** and

a) Browse to the root directory of the BARCO CORONIS Display System Installation CD-ROM.

b) Click on the file, **Setup.exe,** and click **Open**.

or

a) Browse to the root directory of the location where you saved the contents of your BARCO CORONIS Display System Installation CD-ROM.

b) Click on the file, **Setup.exe,** and click **Open**.

5. In the *Open* address window, place your cursor at the end of the line of text that appears and add the following text after *Setup.exe*, a space and *-silent*. Click **OK**.

Example (where D is the name of your CD/DVD drive):

D:\Setup.exe -silent

See figure 35 for an example of how the command line window should look when using the silent install from the BARCO CORONIS Display System Installation CD-ROM.

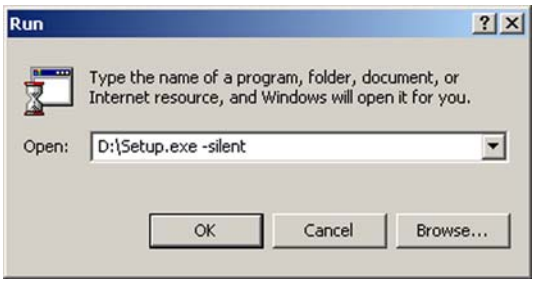

Figure 35: Command line installation

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Where to get more information

Where to find more information

The following documentation is included with your system:

Document	Location	Information
Quick install sheet	System box	Brief overview of the complete system set-up
Online user guide	Installed on the PC	Detailed description of the graphic board control panels and display controls and functions
Getting started guide (PDF)	System CD-ROM	This booklet in PDF format
Online user guide (PDF)	System CD-ROM	Same information as the online user guide on the PC, but in printer-friendly PDF format
QAWeb Agent user guide (PDF)	System CD-ROM	Description of the functions of QAWeb Agent in printer-friendly PDF format

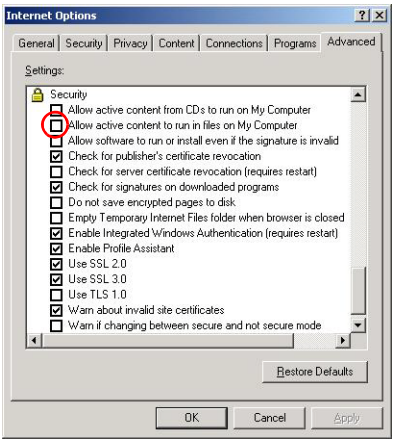
About the online user guide

The online user guide is installed on the system PC during the system driver installation. To open the online user guide, select Start>Program Files>Barco>Documentation>Coronis online user guide from the Windows Start menu.

The online user guide uses Java scripts to create the html pages. In Windows XP, SP2, it is possible that Internet Explorer blocks them for security reasons. To display the pages, proceed as follows:

- In Windows control panel, select **Internet Options**
- Select the **Advanced** tab

- In the **Security** section, check the option **Allow active content to run in files on My Computer**



Troubleshooting

General tips

- If one display from a multi-head system exhibits problems, try to eliminate the problem by switching video cables or power supplies. In that way you can find out if the problem resides in the display or not.

If the display screen remains black after installation:

Possible causes:

- Power is not properly connected
- Video cable is not properly connected
- Video cable is bad
- Display is switched off - activate the power button to switch it on
- PC is started up while the display was not connected - reboot the PC while all displays are connected
- Graphic board resolution is too high or too low
- Two displays with different resolution are connected to the same graphic board
- One of the heads of the graphic board is not attached in the display properties control panel
- PC is in stand-by mode

Configuring Windows

Setting the resolution of your BARCO CORONIS Display

Note: In order to set the resolution of your BARCO CORONIS Display you must be logged in using an account with administrator privileges.

Accessing the Windows Display Control Panel

1. Open the "*Windows Display Control Panel*" by one of the methods below:
   - *a)* Start > Settings > Control Panel > Display
   - *b)* Open the *"Display Properties Control Panel"* by right clicking in an empty area on the desktop, then select **Properties**.
   - *c)* **Windows Vista**: Right click in an empty area on the desktop, select "Personalization", then click on "Display Setting".
2. Click on the **Settings** tab (the **Settings** tab is not present in Vista).
3. Select the **rectangle** that represents the Barco display whose settings you wish to change.

Note: If you are using the VGA capabilities of your BARCOMED display controller, the resolution for the first display may be set to a VGA resolution of *"640 x 480"* pixels with 16 colors and a default refresh rate. If your BarcoMed controller is not running VGA, the display may not be enabled yet. To enable the display, check the *"Extend my Windows desktop onto this monitor"* **checkbox**, but do **NOT** click the **Apply** button at this time.

If you installed your BARCO CORONIS Display System drivers in *SingleView* mode (default for Windows 2000) there will be one

rectangle for the virtual display representing the two heads controlled by each BarcoMed display controller output.

If you installed your BARCO CORONIS Display System drivers in *DualView* mode (default for Windows XP) there will be a rectangle representing each head controlled by each output of the display controller. This will be true even if you have only one display connected to your BarcoMed controller. Both displays of a display controller cannot be enabled at the same time unless their display properties match. If necessary detach the second display of the BarcoMed display controller you are working with by right clicking on the **rectangle** that represents it, deselect **Attached** and click the **Apply** button.

Note: Since Windows will not let you detach the primary display connected to a particular controller, you may need to temporarily make another display the primary display

4. For the display which is still attached click Click on the **Advanced** Button.
5. Select the **Adapter** tab and then click on the **List All Modes** button. Select the resolution and refresh rate that your BARCO CORONIS Display display supports from the dialog box and click **OK**.

Note: In the Adapter box, the Adapter string shows if this display is the First View or the Second View attached to the display controller. Please make a note of this, so that you can arrange the displays in the correct order later if necessary.

6. Click **OK** on the bottom of the *Adapter Control Panel*. If the *"OK"* button on the bottom of the *Adapter Control Panel* is not visible, press the **TAB** key once and then press **CTRL+Enter** to select **OK**.
7. Click **OK** in the "Windows will now apply your new desktop settings" dialog box. Your BARCO CORONIS Display display should now synchronize and display the Windows desktop.
8. Click **Yes** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?"

To set the resolution of the second display attached to the BarcoMed display controller you are working with, go back to the "Settings" tab of the "Display Properties Control Panel". If necessary attach the second display you detached in step 2 above, by right clicking on the rectangle that represents it and selecting **Attached**.

Now repeat steps 5-8 above for this display.

If you are using a Quad-Head Configuration repeat all of the above steps for the two displays on the second display controller.

Note: If you have a single display configuration and you have enabled DualView, Windows will not allow you to attach the second head. This is normal and not a bug.

After enabling DualView and setting the resolutions in a Quad-Head Configuration you may need to drag the heads into the proper position in the window on the *"Settings"* tab, so that the arrangement in the window on the *"Settings"* tab matches the physical arrangement of your configuration.

Setting the Color and Palette Modes

(See ***Barco Controller Control Panel Settings*** section in this manual)

Configuring the Windows desktop

Note: In order to configure the Windows Desktop of your BARCO CORONIS Display System you must be logged in using an account with administrator privileges.

If you are using a color display in conjunction with your Barco grayscale display(s) you should configure your desktop before setting the resolution of the your Barco grayscale display(s).

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Technical Specifications

:

Item	MDCG 2121	MDCG 3120
Product acronym	MDCG 2121	MDCG 3120
Screen technology	TFT AM LCD Dual Domain IPS	TFT AM LCD Dual Domain IPS
Active screen size (diagonal)	541 mm (21.3")	528 mm (20.8")
Active screen size (H x V)	432 x 324 mm (17.0 x 12.8")	424 x 318 mm (16.7 x 12.5")
Aspect ratio (H:V)	4:3	4:3
Resolution	2MP (1600 x 1200)	3MP (2048 x 1536)
Pixel pitch	0.2700 mm	0.2070 mm
Color imaging	No	No
Gray imaging	Yes	Yes
Number of gray-scales (LUT in/LUT out)	1024 grey levels (10/12)	1024 grey levels (10/12)
Viewing angle (H, V)	170°	170°
Uniform Luminance Technology (ULT)	Yes	Yes
Per Pixel Uniformity (PPU)	No	No
Ambient Light Compensation (ALC)	Yes	Yes
Backlight Output Stabilization (BLOS)	Yes	Yes
I-Guard	Yes	Yes

Item	MDCG 2121	MDCG 3120
Maximum luminance*	1650 cd/m²	1000 cd/m²
DICOM calibrated luminance (ULT off)*	500 cd/m²	500 cd/m²
Contrast ratio (typical)*	850:1	900:1
Response time (Tr + Tf)	23 ms	50 ms
Scanning frequency (H; V)	30-150 kHz; 15-80 Hz	30-150 kHz; 15-80 Hz
Housing color	Dark gray	Dark gray
Video input signals	DVI-D Dual Link	DVI-D Dual Link
Video inout terminals	NA	NA
USB ports	1 upstream (endpoint), 3 downstream	1 upstream (endpoint), 3 downstream
USB standard	2.0	2.0
Power requirements (nominal)	100-240V	100-240V
Power consumption (nominal)	54W	64W
Power save mode	Yes	Yes
Power management	DVI-DMPM	DVI-DMPM
Dot clock	280 MHz	280 MHz
OSD languages	English, French, German, Spanish, Italian	English, French, German, Spanish, Italian

Item	MDCG 2121	MDCG 3120
Dimensions with stand (W x H x D)	Portrait: 369 x 558~658 x 285 mm Landscape: 477 x 504~604 x 285 mm	Portrait: 369 x 558~658 x 285 mm Landscape: 477 x 504~604 x 285 mm
Dimensions w/o stand (W x H x D)	Portrait: 369 x 477 x 100 mm Landscape: 477 x 369 x 100 mm	Portrait: 369 x 477 x 100 mm Landscape: 477 x 369 x 100 mm
Dimensions packaged (W x H x D)	599 x 499 x 281 mm (w/o stand)	599 x 499 x 281 mm (w/o stand)
Net weight with stand	14.6 kg	14.2 kg
Net weight w/o stand	8.5 kg	8.1 kg
Net weight packaged with stand	19.5 kg	19.1 kg
Net weight packaged w/o stand	12.5 kg	12.1 kg
Height adjustment range	100 mm	100 mm
Tilt	-5° / +25°	-5° / +25°
Swivel	-45° / +45°	-45° / +45°
Pivot	90°	90°
Mounting standard	VESA (100 mm)	VESA (100 mm)
Screen protection	Protective, non-reflective glass cover	Protective, non-reflective glass cover
Recommended modalitites	CT, MR, US, DR, CR, NM, Film	CT, MR, US, DR, CR, NM, Film

Item	MDCG 2121	MDCG 3120
Certifications	IEC 60950-1:2005, IEC 60601-1:1988 + A1:1991 + A2:1995, IEC 60601-1:2005, IEC 60601-1-2:2007, UL 60950-1, 1st edition, 2007, UL 60601-1, 1st edition - 2006,ANSI/AAMI ES 60601-1:2006,CSA C22.2 No. 60950-1-03, 1st edition, 2006, CAN/CSA-C22.2 No. 601.1-M90, 2005, CAN/CSA-C22.2 No. 60601-1, 2008, CE - 2004/108/EC, CE - 93/42/EEC + 2007/47/EC, Class IIb, CE - 2011/65/EC, EN 60601-1-2:2007, RoHs, Demko - EN 60601-1:1990 + A1:1993 + A2:1995,Demko - EN 60601-1:2006, CCC - GB9254-2008, CCC - GB4943.1-2011, CCC - GB17625.1-2003, KCC, FCC class B, ICES-001 level B,VCCI, FDA 510(k)	IEC 60950-1:2005, IEC 60601-1:1988 + A1:1991 + A2:1995, IEC 60601-1:2005, IEC 60601-1-2:2007, UL 60950-1, 1st edition, 2007, UL 60601-1, 1st edition - 2006,ANSI/AAMI ES 60601-1:2006,CSA C22.2 No. 60950-1-03, 1st edition, 2006, CAN/CSA-C22.2 No. 601.1-M90, 2005, CAN/CSA-C22.2 No. 60601-1, 2008, CE - 2004/108/EC, CE - 93/42/EEC + 2007/47/EC, Class IIb, CE - 2011/65/EC, EN 60601-1-2:2007, RoHs, Demko - EN 60601-1:1990 + A1:1993 + A2:1995,Demko - EN 60601-1:2006, CCC - GB9254-2008, CCC - GB4943.1-2011, CCC - GB17625.1-2003, FCC class B, ICES-001 level B,VCCI, FDA 510(k)

Item	MDCG 2121	MDCG 3120
Supplied accessories	Getting Started Guide Quick-Installation Sheet Video cable (DVI Dual Link) Main cables (UK, European (CEBEC/ KEMA), USA (UL/ CSA; adaptor plug NEMA 5-15P), Chinese (CCC)) USB 2.0 cable External power supply	Getting Started Guide Quick-Installation Sheet Video cable (DVI Dual Link) Main cables (UK, European (CEBEC/ KEMA), USA (UL/ CSA; adaptor plug NEMA 5-15P), Chinese (CCC)) USB 2.0 cable External power supply
Optional accessories	Barco Diagnostic Medical LCD Display Dual Head Stand	Barco Diagnostic Medical LCD Display Dual Head Stand
QA software	MediCal QAWeb	MediCal QAWeb
Units per pallet	NA	NA
Pallet dimensions (W x H)	NA	NA
Warranty	5 years	5 years
Operating temperature	0°C to 40°C, 15°C to 35°C within specs	0°C to 40°C, 15°C to 35°C within specs
Storage temperature	-20°C to 60°C	-20°C to 60°C
Operating humidity	8% - 80% (non-condensing)	8% - 80% (non-condensing)
Storage humidity	5% - 95% (non-condensing)	5% - 95% (non-condensing)
Operating altitude	3000 m	3000 m
Storage altitude	7500 m	7500 m

Item	MDCC 2121
Product acronym	MDCC 2121
Screen technology	TFT AM LCD Dual Domain IPS
Active screen size (diagonal)	541 mm (21.3")
Active screen size (H x V)	432 x 324 mm (17.0 x 12.8")
Aspect ratio (H:V)	4:3
Resolution	2MP (1600 x 1200)
Pixel pitch	0.2700 mm
Color imaging	Yes
Gray imaging	No
Color support	30 bit
Viewing angle (H, V)	170°
Uniform Luminance Technology (ULT)	Yes
Per Pixel Uniformity (PPU)	No
Ambient Light Compensation (ALC)	Yes
Backlight Output Stabilization (BLOS)	Yes
I-Guard	Yes
Maximum luminance*	700 cd/m²
DICOM calibrated luminance (ULT off)*	300 cd/m²

Item	MDCC 2121
Contrast ratio (typical)*	1100:1
Response time (Tr + Tf)	17 ms
Scanning frequency (H; V)	30-150 kHz; 15-80 Hz
Housing color	Gray
Video input signals	DVI-D Dual Link
Video inout terminals	NA
USB ports	1 upstream (endpoint), 3 downstream
USB standard	2.0
Power requirements (nominal)	100-240V
Power consumption (nominal)	54W
Power save mode	Yes
Power management	DVI-DMPM
Dot clock	165 MHz
OSD languages	English, French, German, Spanish, Italian
Dimensions with stand (W x H x D)	Portrait: 381 x 567~667 x 285 mm Landscape: 449 x 513~613 x 285 mm
Dimensions w/o stand (W x H x D)	Portrait: 381 x 489 x 99 mm Landscape: 489 x 381 x 99 mm
Dimensions packaged (W x H x D)	599 x 499 x 281 mm (w/o stand)
Net weight with stand	15.1 kg

Item	MDCC 2121
Net weight w/o stand	9.0 kg
Net weight packaged with stand	19.0 kg
Net weight packaged w/o stand	12.0 kg
Height adjustment range	100 mm
Tilt	-5° / +25°
Swivel	-45° / +45°
Pivot	90°
Mounting standard	VESA (100 mm)
Screen protection	Protective, non-reflective glass cover
Recommended modalitites	CT, MR, US, DR, CR, NM, Film
Certifications	IEC 60950-1:2005, IEC 60601-1:1988 + A1:1991 + A2:1995, IEC 60601-1:2005, IEC 60601-1-2:2007, UL 60950-1, 1st edition, 2007, UL 60601-1, 1st edition - 2006,ANSI/AAMI ES 60601-1:2006,CSA C22.2 No. 60950-1-03, 1st edition, 2006, CAN/CSA-C22.2 No. 601.1-M90, 2005, CAN/CSA-C22.2 No. 60601-1, 2008, CE - 2004/108/EC, CE - 93/42/EEC + 2007/47/EC, Class IIb, CE - 2011/65/EC, EN 60601-1-2:2007, RoHs, Demko - EN 60601-1:1990 + A1:1993 + A2:1995,Demko - EN 60601-1:2006, CCC - GB9254-2008, CCC - GB4943.1-2011, CCC - GB17625.1-2003, FCC class B, ICES-001 level B,VCCI, FDA 510(k)

Item	MDCC 2121
Supplied accessories	Getting Started Guide Quick-Installation Sheet Video cable (DVI Dual Link) Main cables (UK, European (CEBEC/KEMA), USA (UL/CSA; adaptor plug NEMA 5-15P), Chinese (CCC)) USB 2.0 cable External power supply
Optional accessories	Barco Diagnostic Medical LCD Display Dual Head Stand
QA software	MediCal QAWeb
Units per pallet	NA
Pallet dimensions (W x H)	NA
Warranty	5 years
Operating temperature	0°C to 40°C, 15°C to 35°C within specs
Storage temperature	-20°C to 60°C
Operating humidity	8% - 80% (non-condensing)
Storage humidity	5% - 95% (non-condensing)
Operating altitude	3000 m
Storage altitude	7500 m

Warranty Statement

BARCO MID GENERAL WARRANTY TERMS AND CONDITIONS

Applicable from Jan 1st 2008

ARTICLE 1: PRODUCT WARRANTY

Barco nv, Medical Imaging Division warrants that the equipment will be free of defects in workmanship or material for the warranty period or the specific period of a warranty extension program.

Hardware: Barco warrants that upon delivery hereunder the Products shall (i) conform to its specifications in effect at the date of delivery and (ii) be free from defects in material and workmanship (the "Warranties").

Software: Barco warrants that software written by Barco shall perform substantially in accordance with the specifications in effect at the date of delivery. Software is inherently susceptible to bugs and errors. Barco makes no warranties with respect to the software which is provided to Customer on an "as-is" basis and does not warrant uninterrupted or error-free operation of the Products.

Unless otherwise indicated in Barco's Product manual or in the agreement between Barco and Customer, the Warranty Period shall be

(a) Hardware: 12 months commencing on the Barco date of invoice.

(b) Software: 3 months commencing on the Barco date of invoice.

Notwithstanding the provisions of clause 2, repair and replacement of defects in material and/or workmanship under this warranty shall be accomplished in our works according to the terms and conditions as set forth hereafter:

1.1

Any claim under the Warranties must be notified to Barco in writing within 8 days from the date the defect or failure has been discovered or noticed the first time. The Customer, upon the occurrence of any equipment failure, shall contact Barco nv, MID customer support centre (or an authorised service centre) by telephone, fax or e-mail and shall provide the applicable customer support person with a complete description of the problem being encountered, including the model and serial number of the equipment in which the problem has arisen.

1.2

The customer support person shall diagnose the problem experienced by the Customer and shall advise the Customer on how to proceed. Customer support may ask to return the faulty equipment or faulty subassemblies to the Barco nv, or a MID customer support centre (or an authorised service centre) for repair activities. In no event shall Customer return a defective Product or part thereof to Barco without Barco's prior written approval.

In the event the return to Barco of the defective Product is authorized by Barco, Barco shall issue to Customer an RMA (Return Material Authorization).

The Customer shall apply for an RMA number to the closest Barco nv, MID Customer support centre (or an authorised service centre) as listed at www.barcomedical.com, unless otherwise indicated.

The one-way cost of packing, transport and insurance related to shipping the alleged defective Product or part to Barco for repair or replacement shall be borne by Customer. The one-way cost of packing, transport and insurance related to shipping of the repaired or replacement Product or part to Customer shall be borne by Barco.

1.3

The Customer shall return, freight prepaid, the defective equipment or subassemblies in its original packaging with the assigned RMA number for repair to the Barco nv, MID Customer support centre (or an authorised service centre).

1.4

Replacement parts used shall be new or equivalent to new parts for the revision level of the equipment. A replacement LCD panel will be new or similar run time. The warranty period for the replacement parts will expire at the same moment as the original warranty period of the equipment. All parts replaced hereunder and returned to Barco nv, MID (or an authorised service centre) shall become the property of Barco nv, MID (or the authorised service centre).

1.5

The repaired equipment shall be returned to the Customer, by regular freight, at Barco nv, MID's charge.

1.6

Barco nv, MID will replace a product that fails within 90 days after shipment from Barco with a new one, ensuring color matching in the event of a diagnostic multi head display configuration.

Barco aims to ship the new replacement product within 2 business days after receipt of the Customers notification in writing.

ARTICLE 2: CONDITIONS PRECEDENT FOR WARRANTY AND ITEMS EXCLUDED FROM WARRANTY

A. The Warranties shall apply only to the extent the Products or any parts thereof have

(i) been transported and stored at all times in the original packaging in the conditions as specified by Barco (such as covered and secure location, minimum and maximum temperature, maximum humidity, ...) or, in absence thereof, at least in conditions consistent with generally accepted practice for this type of products;

(ii) been handled at all times in accordance with Barco's instructions or, in absence thereof, at least with the care and caution consistent with generally accepted practice for this type of products;

(iii) been installed strictly in accordance with the instructions and directions given by Barco (if and to the extent the Products have not been installed by Barco or its authorized subcontractors);

(iv) not been subject to any unauthorized access, alteration, modification or repair or attempts thereto;

(v) been at all times "normally used" for the intended purpose and operated in strict accordance with the operating instructions set forth in the operating manual of the Product in question and shall not have been otherwise misused, abused, damaged. For the purpose hereof, "normally used" shall mean a regular, ordinary and routine usage of the Product in question as intended and/or recommended by Barco;

(vi) been maintained at all times in accordance with Barco's instructions or, in absence thereof, at least with intervals and in a manner consistent with generally accepted practice for this type of products;

B. The warranty described herein shall not include the following:

2.1

Any hardware or software item procured from a source other than Barco nv, MID or their official agent or distributor and integrated by Customer or a third party into Barco nv, MID supplied equipment.

2.2

Any host configuration not explicitly supported by Barco nv, MID.

2.3

All software installed on the system, whether they are acquired from Barco nv, MID or third party. An exception is made for software delivered by Barco nv, MID that would prove to be a cause for the mal functioning of the hardware covered under this Agreement.

2.4

Normal wear and tear, use under circumstances exceeding specifications, such as use in dusty environment or under excessive temperature conditions, abuse, unauthorised repair or alternation, lack of proper configuration or maintenance, damaged or modified or removed serial number, cosmetic refurbishment.

2.5

Repair or replacement of consumables[1] or specific parts that by definition are subject to wear and tear, including but not limited to:

a.CRT's, LCD panels

b.Backlights in diagnostic LCD displays, when the backlight run time[2] is beyond the Guaranteed Backlight Lifetime[3] of that model, when used at the Factory Calibrated Luminance[4]

Eg1.

- A display is used at 8 hours/day; ie. +/-2.920hours/year
- The display system is covered with a warranty period of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 4 year, thus corresponding to +/-11.680hours
- Result: the backlight replacement is performed under warranty

Eg2.

- A display is used at 24 hours/day; ie. 8.760hours/year
- The display system is covered with a warranty program of 5 year
- The Guaranteed Backlight Lifetime of that model is 17.000hours.
- The Factory Calibrated Luminance cannot be achieved anymore after 2.5years, thus corresponding to +/-21.900hours
- Result: the backlight replacement does not make part of the warranty coverage.

(1): 'Consumable' is a part that can be replaced by the user

(2): 'Backlight run time' is the total time that an image (including use of a screen saver) has been applied to the screen; this value can be consulted via the OSD buttons (On Screen Display).

(3): 'Guaranteed Backlight Lifetime' is the number of backlight hours during which a predefined luminance value, ie. the Factory Calibrated Luminance, will be provided by a specific diagnostic display model. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

(4): 'Factory Calibrated Luminance': is the typical luminance value that a specific diagnostic display model is calibrated at during the production process. This figure is printed on the Warranty certificate of each display or can be requested at your local Barco office.

c. Lamps, optical components in projectors

d. Replacement because of:

i. image retention as a result of:

- not correctly using screen saver and/or Display Power Management System (DPMS) as explained in the user manual
- prolonged operation of the display with a static image on the same screen area

ii. a number of missing pixels that is lower than the total allowable number as mentioned in the product specifications.

iii. difference in color temperature that is lower than the total allowable difference as mentioned in the product specifications

iv. difference in color temperature as a result of not using all displays of a multi-head configuration at the same rate.

v. LCD luminance uniformity that is in within the product specifications or luminance uniformity performance that is inherent to LCD technology.

Barco nv, MID does not warrant a minimum life time nor a performance of any of the consumables.

2.6

Replacement of moveable parts such as power cords, remote controls, ...

2.7

Any product disassembly and installation costs at the operation site, travel expenses and travel time to and from the operation site for the personnel in charge of the repair works and transport charges.

2.8

Any failures resulting from an accident, negligence (such as but not limited to removing or deleting system files & licensed software product files), misuse, circuit failure or any change, damage due to fire, water, thunder or lightning, power failure or fluctuation, disruption of communication lines or due to force majeure, or any reason foreign to the equipment.

2.9

Any specific services or procedures, asked for by Customer, related to verification of repaired equipment.

2.10 The evaluation cost in case of a returned product deemed functional is not covered under warranty and will be charged to the Customer, at Barco's sole discretion, based on a case-by-case evaluation.

ARTICLE 3: OBLIGATIONS OF THE CUSTOMER

Customer hereby assumes the following obligations as partial consideration for Barco nv, MID performance of its requirements under the warranty condition; failure by Customer to meet its obligations under this paragraph shall excuse Barco nv, MID's performance hereunder:

3.1

Customer shall not expose Barco nv, MID personnel to any unsafe working conditions.

3.2

Repairs to equipment under warranty resulting from improper maintenance or repair performed by the Customer, or its officers, agents, employees, or representatives, shall be borne by the Customer at its additional cost and expense.

3.3

The Customer is responsible for installing the Barco nv, MID equipment in an environment for which it was intended. If there is an indication that the equipment was used – even temporary – outside its specifications, Barco nv, MID is entitled not to perform warranty repairs and terminate the warranty agreement. Any actions that have been taken by Barco nv, MID in this respect, may be invoiced to the Customer at normal pricing.

ARTICLE 4: REMEDIES UNDER WARRANTY

(a) Hardware: If during the Warranty Period a Product or any part thereof, fails to meet any of the Warranties then, upon Customer's request, Barco shall, at its sole option and cost, promptly and within 20 working days, either: (i) repair or correct the Product or part in question; or (ii) replace the Product or supply part(s) or component(s) according to the terms and conditions contained in article 1. A replacement part shall be at least functionally equivalent to the original part. The replaced Product, parts and/or components shall become the property of Barco and shall, at Barco's request, be returned by Customer to Barco at Barco's cost.

(b) Software: Barco's sole obligation shall be to rectify substantial malfunctions of the software (to the extent technically reasonably possible) by amending the software or supplying an alternative version of the software.

(c) The repair or replacement under the Warranties covers the cost of material and labor.

ARTICLE 5: DISCLAIMER OF WARRANTIES

BARCO NV, MID DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ARTICLE 6: LIMITATION OF LIABILITY

The remedies specified in these Terms and Conditions shall constitute Customer's sole and exclusive

remedy and Barco's sole and exclusive liability for Barco's breach of the Warranties hereunder.

BARCO NV, MID SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, SUCH AS BUT NOT LIMITED TO, DAMAGE TO OR LOSS OF TANGIBLE OR INTANGIBLE PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUES, COST OF CAPITAL, COST OF PURCHASE OF REPLACEMENT GOODS, OR CLAIMS OF USER FOR SERVICE INTERRUPTIONS. THE LIABILITY OF BARCO NV, MID FOR MANUFACTURING, SALE, DELIVERY, RESALE, INSTALLATION, OPERATION OR SUITABILITY FOR USE OF ANY PRODUCTS OR SERVICES COVERED BY OR FURNISHED UNDER THIS WARRANTY CONDITION, WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, STRICT TORT, WARRANTY OR OTHERWISE, SHALL NOT EXCEED THE PRICE OF THE ITEM OR ITEMS OF GOODS OR SERVICES UPON WHICH SUCH LIABILITY IS BASED.

ARTICLE 7: FORCE MAJEURE

Either party shall be released from performance of its obligations under this agreement to the extent, and for so long as, the performance of this agreement is impeded by reason of force majeure. For the purposes of this clause the expression "force majeure" means, but shall not be limited to, industrial dispute, fire, mobilisation, requisition, embargo, currency transfer prohibitions, insurrection, lack of means of transport, restrictions of the use of energy, and generally any circumstances which are beyond the control of the parties and hinder performance by one party of his obligations.

ARTICLE 8: GENERAL

8.1

Customer acknowledges its understanding that all software and electronic devices, including Barco nv, MID products are subject to possible error, mechanical or electrical failure, and should not be relied upon in inappropriate applications or without proper backup and/or other safety precautions whenever personal injury or property damage may result from failure or error of the product.

8.2

Barco nv, MID shall not be responsible for machine failure and/or its failure to render service or maintenance due to causes beyond its reasonable control.

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